

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in this application:

Listing of claims:

1-28. (Canceled)

29. (New) A method of boosting alkaline hydrolysis or erodability of a paint formulation, the method comprising the step of adding an organosilyl ester of a carboxylic, sulphonic or phosphoric acid to a binder system of a paint formulation wherein the carboxylic, sulphonic or phosphoric acid part of the organosilyl ester is saturated at the alpha carbon.

30. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein more than one organosilylester of a carboxylic, sulphonic or phosphoric acid is used.

31. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein the binder system comprises a film forming binder.

32. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein the organosilylester is film forming.

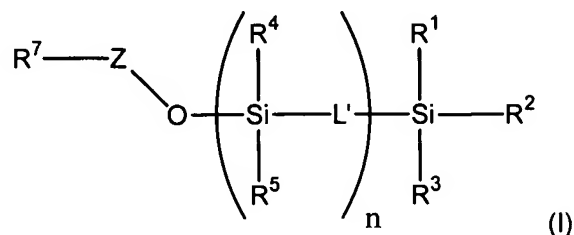
33. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein the carboxylic, sulphonic or phosphoric acid part of the organosilyl ester is other than rosin.

34. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein said carboxylic acid is a monocarboxylic acid.

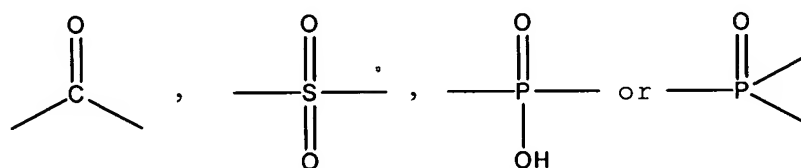
35. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein the paint formulation is an antifouling paint.

36. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein the organosilyl ester of the carboxylic, sulphonic or phosphoric acid is based on a hydrocarbyl residue of three or more carbons.

37. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein the organosilyl ester of the acid is represented by the general formula (I):



wherein Z represents:



wherein each R^4 and R^5 may be hydroxyl or may be independently selected from alkyl, aryl, alkoxy, aryloxy, $-\text{L}'-\text{SiR}^1\text{R}^2\text{R}^3$, $-\text{L}'-(\text{SiR}^4\text{R}^5\text{L}')_n-\text{SiR}^1\text{R}^2\text{R}^3$, $-\text{L}'-\text{SiR}^1\text{R}^2-$, $-\text{L}'-(\text{SiR}^4\text{R}^5\text{L}')_n-\text{SiR}^1\text{R}^2-$, alkenyl, alkynyl, aralkyl or aralkyloxy radicals optionally substituted by one or more substituents independently selected from the group comprising alkyl, alkoxy, aralkyl, aralkyloxy, hydroxyl, aryl, aryloxy, halogen, amino or amino alkyl radicals, or R^4 or R^5 may independently be an $-\text{O}-\text{Z}-\text{R}^8$ group, wherein R^8 is defined as R^7 below;

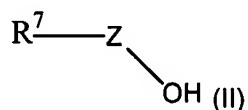
wherein each R^1 , R^2 and R^3 may independently represent hydrogen, hydroxyl, alkyl, alkenyl, alkynyl, alkoxy, aryl, aryloxy, aralkyl or aralkyloxy radical optionally substituted by one or more substituents independently selected from the group comprising alkyl, alkoxy, aralkyl, aralkyloxy, aryl, aryloxy, halogen, hydroxyl, amino or amino alkyl radicals, or R^1 , R^2 or R^3 may independently be an $-\text{O}-\text{Z}-\text{R}^8$ group,

L' represents O, S, or NR^6 , where R^6 is defined as is R^9 below,

each n independently represents a number of $-\text{Si}(\text{R}^4)(\text{R}^5)-\text{L}'-$ groups from 0 to 1000,

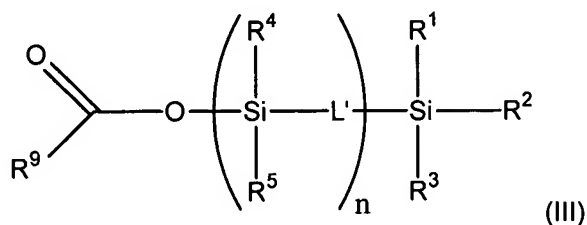
wherein R^7 is an aralkyl, aryl, alkenyl, alkynyl, or a C_2 or higher alkyl group optionally substituted, in the case of the hydrocarbyl radicals with one or more substituents selected from the equivalent substituents as defined for R^1 , R^2 , R^3 , R^4 and R^5 above.

38. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 37, wherein the organosilyl ester of formula (I) is produced by reaction of a higher boiling acid of formula (II)



wherein Z and R⁷ are as defined in claim 9;

with a silyl ester of a lower boiling acid of formula (III)



wherein R¹, R², R³, R⁴, R⁵, L' and n are defined in claim 9 except where R¹, R², R³, R⁴ or R⁵ are an -O-Z-R⁸ group in formula I they may be replaced by an -O-Z-R¹⁰ group in formula III;

wherein R⁹ is defined as R⁷ above except R⁹ may also be hydrogen or C₁ alkyl and with the proviso that the acid of the ester formed by R⁹ (R⁹ZOH) boils at a lower temperature than the acid R⁷ZOH of formula (II);

wherein R¹⁰ is defined as R⁷ above except R¹⁰ may also be hydrogen or C₁ alkyl and with the proviso that the acid of the ester formed by R¹⁰ (R¹⁰ZOH) boils at a lower temperature than the acid R⁷ZOH of formula (II);

while removing the formed acid group of formula (IV) and/or (V)



from the system to produce at least one protected acid group of said formula (I).

39. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 37, wherein when an acylated silyl ester is represented by formula I it has more than one acyloxy group attached to one or several silicon atoms.

40. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 38, wherein the carboxyl radical part of formula (IV) is selected from formyl, acetyl, propionyl and butyryl.

41. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 38, wherein the carboxyl radical part of formula R^7ZOH independently includes propionyl, butyryl, pivaloyl, oxaloyl, malonyl, succinyl, glutaryl, adipoyl, benzoyl, phthaloyl, isobutyroyl, sec-butyroyl, octanoyl, isooctanoyl, nonanoyl, isononanoyl, abietyl, dehydroabietyl, dihydroabietyl, naphthenyl, anthracenyl, abietyl dimer, fully hydrogenated dihydroabietyl and the like and polymers or copolymers thereof.

42. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 38, wherein the organosilylated carboxylate compounds of general formula (III) are selected from the group consisting of:- trimethylsilylformiate, dimethylsilyldiformiate, methylsilyltriformiate, tri-n-butyl 1-acetoxy-silane, di-n-butyl 1,1-diacetoxy-silane, n-butyl 1,1,1-triacetoxy-silane, tri-n-propyl-1-acetoxy silane, di-n-propyl 1,1-diacetoxy-silane, n-propyl 1,1,1-triacetoxy-silane, tri-t-butyl-1-acetoxy-silane, tri-isopropyl-1-acetoxy-silane, tri-isobutyl-1-acetoxy-silane, tri-methyl-1-acetoxy-silane, di-methyl 1,1-diacetoxy-silane, methyl 1,1,1-triacetoxy-silane, triethyl-1-acetoxy-silane, diethyl-1,1-diacetoxy-silane, ethyl 1,1,1-triacetoxy-silane, vinyl 1,1,1-triacetoxy-silane, tribenzyl-1-acetoxy-silane, triamyl-1-acetoxy-silane, triphenyl-1-acetoxy-silane, trimethylsilylpropionate, t-butyl dimethylsilylacetate, pentamethyl-1-acetoxy-disiloxane, heptamethyl-1-acetoxy-trisiloxane, nonamethyl-1-acetoxy-tetrasiloxane, nonaethyl-1-acetoxy-tetrasiloxane, nona-t-butyl-1-acetoxy-tetrasiloxane, nonabenzyl-1-acetoxy-tetrasiloxane, nona-isopropyl-1-acetoxy-tetrasiloxane, nona-n-propyl-1-acetoxy-tetrasiloxane, nona-isobutyl-1-acetoxy-tetrasiloxane, nona-amyl-1-acetoxy-tetrasiloxane, nona-n-butyl-1-acetoxy-tetrasiloxane, nona-dodecyl-1-acetoxy-tetrasiloxane, nona-hexyl-1-acetoxy-tetrasiloxane, nona-phenyl-1-acetoxy-tetrasiloxane, nona-octyl-1-acetoxy-tetrasiloxane, undecamethyl-1-acetoxy-pentasiloxane, undecaethyl-1-acetoxy-pentasiloxane, undeca-t-butyl-1-acetoxy-pentasiloxane, undecabenzyl-1-acetoxy-pentasiloxane, undeca-isopropyl-1-acetoxy-pentasiloxane, undeca-n-propyl-1-acetoxy-pentasiloxane, undeca-isobutyl-1-acetoxy-pentasiloxane, undeca-amyl-1-acetoxy-pentasiloxane, undeca-n-butyl-1-acetoxy-pentasiloxane, undeca-dodecyl-1-acetoxy-pentasiloxane, undeca-hexyl-1-acetoxy-pentasiloxane, undeca-phenyl-1-acetoxy-pentasiloxane, undeca-octyl-1-acetoxy-pentasiloxane, tridecamethyl-1-acetoxy-hexasiloxane, tridecaethyl-1-acetoxy-hexasiloxane, trideca-t-butyl-1-acetoxy-hexasiloxane, tridecabenzyl-1-acetoxy-

hexasiloxane, trideca-isopropyl-1-acetoxy-hexasiloxane, trideca-n-propyl-1-acetoxy-hexasiloxane, trideca-isobutyl-1-acetoxy-hexasiloxane, trideca-amyl-1-acetoxy-hexasiloxane, trideca-n-butyl-1-acetoxy-hexasiloxane, trideca-dodecyl-1-acetoxy-hexasiloxane, trideca-hexyl-1-acetoxy-hexasiloxane, trideca-phenyl-1-acetoxy-hexasiloxane, trideca-octyl-1-acetoxy-hexasiloxane.

43. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 38, wherein the organosilylated carboxylate compounds of general formula (III) are selected from ethyl triacetoxy silane, vinyltriacetoxy silane, dimethyldiacetoxy silane and trimethylsilylacetate.

44. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 38, wherein said higher boiling acid which can be silylated to produce the silylesters of formula I is selected from acids of C₃ and above.

45. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein the formulation includes a co-binder selected from:

- (a) Resinates of Ca, Cu or Zn;
- (b) Naphthenates of Ca, Cu, Zn;
- (c) Vinyls;
- (d) Acrylates;
- (e) Cu/Zn/Ca acrylates or polyesters;
- (f) Tri-organosilyl(meth)acrylates copolymers; and
- (g) Hydrophilic (meth) acrylates.

46. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 45, wherein said co-binder is selected from tri organo silyl(meth) acrylate copolymers.

47. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 45, wherein the binders incorporate poly(silylesters) or polyfunctional acids to help improve the film forming properties of the binder.

48. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 44, wherein said higher boiling acid which can be silylated to produce said silylester of formula (I) is selected from aliphatic acid homologues greater than or equal to propionic acid, cyclic aliphatic acids, C₄ – C₆₀ aromatic and unsaturated acids.

49. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 44, wherein said higher boiling acid which can be silylated to produce said silylester of formula (I) is hydrogenated rosin.

50. (New) A method of boosting the alkaline hydrolysis or erodability of a paint formulation according to claim 29, wherein the binder incorporates abietyl dimers to help improve the film forming properties of the binder.

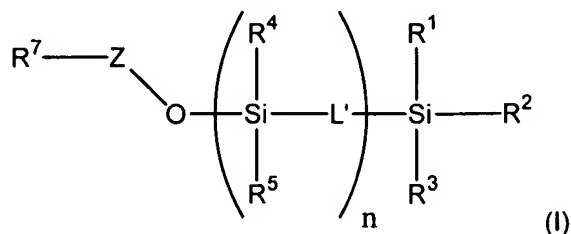
51. (New) A paint composition comprising silylesters of monocarboxylic, sulphonic or phosphoric acid other than rosin as a binder component of the binder system wherein the formulation includes a co-binder selected from:

- (a) Resinates of Ca, Cu or Zn;
- (b) Naphthenates of Ca, Cu, Zn;
- (c) Acrylates;
- (d) Cu/Zn/Ca acrylates or polyesters;
- (e) Tri-organosilyl(meth)acrylates copolymers; and
- (f) Hydrophilic (meth) acrylates.

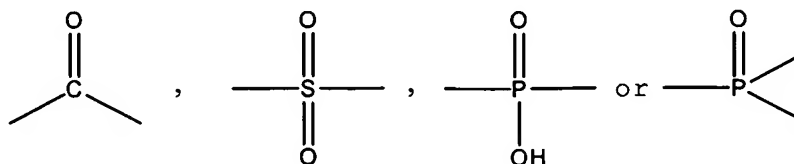
52. (New) A paint composition according to claim 51, wherein the carboxylic, sulphonic or phosphoric acid part of the organosilyl ester is saturated at the alpha carbon.

53. (New) A paint composition according to claim 51, which comprises a mixture of the said silylesters.

54. (New) A paint composition according to claim 51, wherein the organosilyl ester of the acid is represented by the general formula (I):



wherein Z represents:



wherein each R^4 and R^5 may be hydroxyl or may be independently selected from alkyl, aryl, alkoxyl, aryloxy, $-L'-SiR^1R^2R^3$, $-L'-(SiR^4R^5L')_n-SiR^1R^2R^3$, $-L'-SiR^1R^2-$, $-L'-(SiR^4R^5L')_n-SiR^1R^2-$, alkenyl, alkynyl, aralkyl or aralkyloxy radicals optionally substituted by one or more substituents independently selected from the group comprising alkyl, alkoxyl, aralkyl, aralkyloxy, hydroxyl, aryl, aryloxy, halogen, amino (preferably, tertiary amino) or amino alkyl radicals, or R^4 or R^5 may independently be an $-O-Z-R^8$ group, wherein R^8 is defined as R^7 below; wherein each R^1 , R^2 and R^3 may independently represent hydrogen, hydroxyl, alkyl, alkenyl, alkynyl, alkoxyl, aryl, aryloxy, aralkyl or aralkyloxy radical optionally substituted by one or more substituents independently selected from the group comprising alkyl, alkoxyl, aralkyl, aralkyloxy, aryl, aryloxy, halogen, hydroxyl, amino (preferably, tertiary amino) or amino alkyl radicals, or R^1 , R^2 or R^3 may independently be an $-O-Z-R^8$ group, L' represents O, S, or NR^6 , where R^6 is defined as is R^9 below, each n independently represents a number of $-Si(R^4)(R^5)-L'$ groups from 0 to 1000, wherein R^7 is an aralkyl, aryl, alkenyl, alkynyl, or a C_2 or higher alkyl group optionally substituted, in the case of the hydrocarbyl radicals with one or more substituents selected from the equivalent substituents as defined for R^1 , R^2 , R^3 , R^4 and R^5 above.

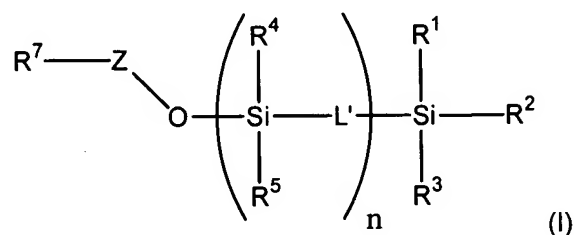
55. (New) A paint composition according to claim 51, wherein said co-binder is selected from triorgano silyl(meth) acrylate copolymers.
56. (New) A paint composition according to claim 51, wherein the binder incorporates poly(silylestere)s or polyfunctional acids to help improve the film forming properties of the binder.
57. (New) A paint composition according to claim 51, wherein the binder incorporates abietyl dimers to help improve the film forming properties of the binder.
58. (New) A hydrolysable antifouling paint composition comprising silylestere)s of monocarboxylic, sulphonic or phosphoric acid other than rosin as a binder component of a binder system.
59. (New) A hydrolysable antifouling paint composition according to claim 58, wherein the paint composition includes an antifoulant.
60. (New) A hydrolysable antifouling paint composition according to claim 58, wherein the formulation includes a co-binder selected from:
 - (a) Resinates of Ca, Cu or Zn;
 - (b) Naphthenates of Ca, Cu, Zn;
 - (c) Acrylates;

- (d) vinyls;
- (e) Cu/Zn/Ca acrylates or polyesters;
- (f) Tri-organosilyl(meth)acrylates copolymers; and
- (g) Hydrophilic (meth) acrylates.

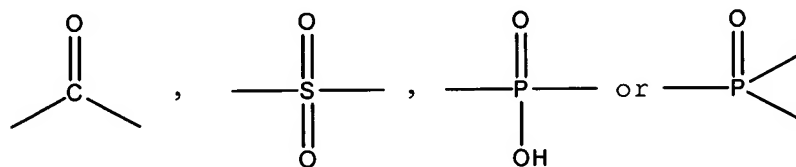
61. (New) A hydrolysable antifouling paint composition according to claim 58, wherein the carboxylic, sulphonic or phosphoric acid part of the organosilyl ester is saturated at the alpha carbon.

62. (New) A hydrolysable antifouling paint composition according to claim 58, which comprises a mixture of the said silylesters.

63. (New) A hydrolysable antifouling paint composition according to claim 58, wherein the organosilyl ester of the acid is represented by the general formula (I):



wherein Z represents:



wherein each R^4 and R^5 may be hydroxyl or may be independently selected from alkyl, aryl, alkoxy, aryloxy, $-L'-SiR^1R^2R^3$, $-L'-(SiR^4R^5L')_n-SiR^1R^2R^3$, $-L'-SiR^1R^2-$, $-L'-(SiR^4R^5L')_n-SiR^1R^2-$, alkenyl, alkynyl, aralkyl or aralkyloxy radicals optionally substituted by one or more substituents independently selected from the group comprising alkyl, alkoxy, aralkyl, aralkyloxy, hydroxyl, aryl, aryloxy, halogen, amino (preferably, tertiary amino) or amino alkyl radicals, or R^4 or R^5 may independently be an $-O-Z-R^8$ group, wherein R^8 is defined as R^7 below;

wherein each R^1 , R^2 and R^3 may independently represent hydrogen, hydroxyl, alkyl, alkenyl, alkynyl, alkoxy, aryl, aryloxy, aralkyl or aralkyloxy radical optionally substituted by one or more

substituents independently selected from the group comprising alkyl, alkoxy, aralkyl, aralkyloxy, aryl, aryloxy, halogen, hydroxyl, amino (preferably, tertiary amino) or amino alkyl radicals, or R^1 , R^2 or R^3 may independently be an $-O-Z-R^8$ group,

L' represents O, S, or NR^6 , where R^6 is defined as is R^9 below,

each n independently represents a number of $-Si(R^4)(R^5)-L'$ groups from 0 to 1000,

wherein R^7 is an aralkyl, aryl, alkenyl, alkynyl, or a C_2 or higher alkyl group optionally substituted, in the case of the hydrocarbyl radicals with one or more substituents selected from the equivalent substituents as defined for R^1 , R^2 , R^3 , R^4 and R^5 above.

64. (New) A hydrolysable antifouling paint composition according to claim 60, wherein said co-binder is selected from tri organo silyl(meth) acrylate copolymers.

65. (New) A hydrolysable antifouling paint composition according to claim 58, wherein the binder incorporates poly(silylesters) or polyfunctional acids to help improve the film forming properties of the binder.

66. (New) A hydrolysable antifouling paint composition according to claim 65, wherein the binder incorporates abietyl dimers to help improve the film forming properties of the binder.